Volunteer Lake Assessment Program Individual Lake Reports

MOUNTAINVIEW LAKE, SUNAPEE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	832	**Max. Depth (m):**	6.7	**Flushing Rate (yr^{-1})**	1
Surface Area (Ac.):	105	**Mean Depth (m):**	4.1	**P Retention Coef:**	0.69
Shore Length (m):	3,700	**Volume (m^3):**	1,758,000	**Elevation (ft):**	1116

TROPHIC CLASSIFICATION

Year	Trophic class
1978	OLIGOTROPHIC
1992	OLIGOTROPHIC

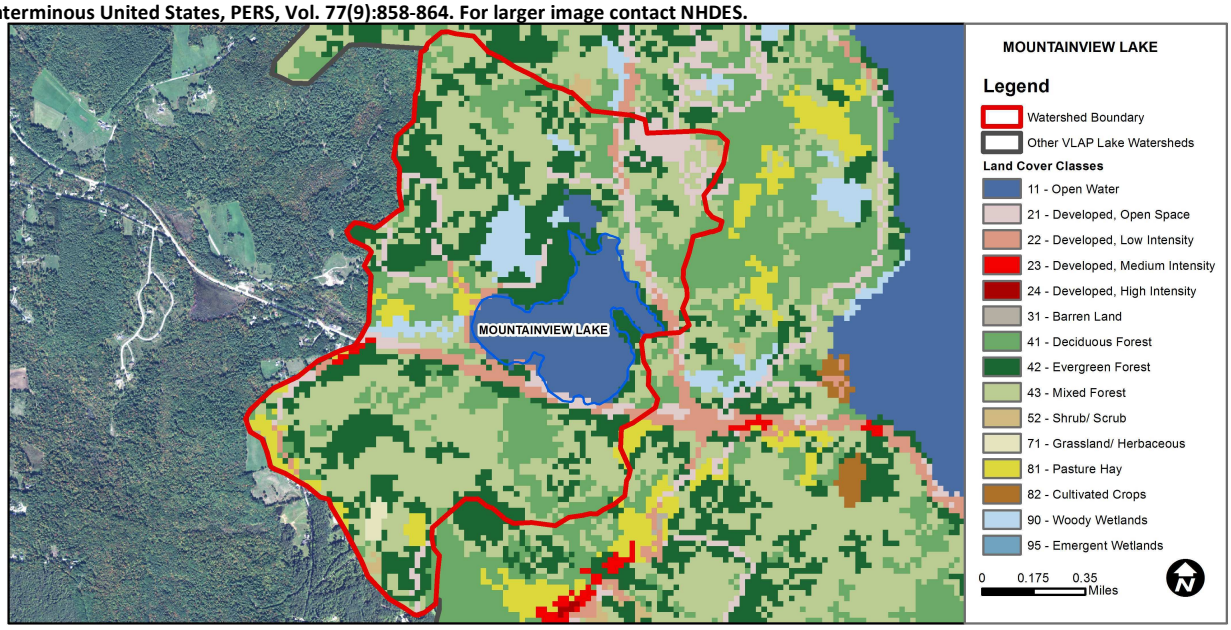
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Cautionary	The calculated median is fewer than 5 samples but > indicator and the chlorophyll a indicator is okay. More data needed.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	11.7	Barren Land	0.04	Grassland/Herbaceous	0.45
Developed-Open Space	6.05	Deciduous Forest	13.62	Pasture Hay	2.57
Developed-Low Intensity	3.09	Evergreen Forest	23.9	Cultivated Crops	0
Developed-Medium Intensity	0.21	Mixed Forest	34.41	Woody Wetlands	3.09
Developed-High Intensity	0	Shrub-Scrub	0.39	Emergent Wetlands	0

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Mountainview Lake, Sunapee

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were average in early July, slightly elevated in late July and remained slightly elevated into August. The 2014 average chlorophyll level was slightly greater than the state median and remained stable from 2013. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** North Brook, North Hamel Rd. In Lake, and Rt. 103 Inlet conductivity levels were low to average. Deep spot, Culvert at 111 Hamel Rd., Mud Pond Bk., and Outlet conductivity levels were slightly elevated. Hamel Bk., Hamel Bk. at 103, North Bk., and North Hamel Rd. Inlet conductivity levels were elevated. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began.
- **E. coli:** Mt. View Shores Beach E. coli levels were very low and much less than the state standard for public beaches (88 cts/100 mL).
- **Total Phosphorus:** Epilimnetic phosphorus levels were stable and low in July and August and the 2014 average was less than the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Hypolimnetic (lower water layer) phosphorus was average and remained fairly stable from July to August. Hamel Bk., Mud Pond Bk., Rt. 103 Inlet, and Outlet phosphorus levels were within average ranges for those stations. Phosphorus levels at all other tributary stations were elevated. Many of those samples contained sediments and/or organic matter that likely contributed to the elevated levels and low flow conditions also contributed in some cases. Hamel Bk. at 103, Culvert at 111 Hamel Rd. and North Bk. experienced elevated phosphorus following significant storm event in late July.
- **Transparency:** Transparency improved from early July to late July and then worsened in August. Average transparency was less than the state median and historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was better than that measured without and may be a better representation of actual conditions.
- **Turbidity:** Epilimnetic and hypolimnetic turbidities were low in July and slightly elevated in August likely due to slightly elevated algal growth throughout the water column. With the exception of Rt. 103 Inlet and the Outlet, tributary turbidities were generally elevated on each sampling event. Sediment and organic material were noted in several samples and likely contributed to elevated turbidities.
- **pH:** Epilimnetic and hypolimnetic pH levels fluctuated below the desirable range 6.5-8.0 units. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began. Several tributary pH levels were less than desirable. As pH levels decreased, they can become potentially critical to the survival and reproduction of aquatic life.
- **Recommended Actions:** Contact the VLAP Coordinator to schedule a biologist visit for your first sampling event in 2015. Several tributary samples contained sediment and organic material that likely caused elevated turbidity and phosphorus levels. Only sample tributaries if there is sufficient flow to obtain clean samples. If the tributaries were turbid following a significant storm event this could be a sign of erosion in the sub-watershed. The increased frequency and intensity of storm events highlights the importance of managing stormwater runoff from lake and watershed properties, dirt/gravel roads and steep slopes. North Inlet has a history of elevated phosphorus levels. Conduct bracket sampling to help identify source(s) of phosphorus in the sub-watershed. Conduct Apparent Color analysis on the Epilimnion sample during the biologist visit to understand if the lake has become more tea colored over time. This could be contributing to the decreased transparency. Keep up the great work!

Station Name	Table 1. 2014 Average Water Quality Data for MOUNTAINVIEW LAKE								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	7.13	4.90	124.8		10	2.87	3.56	1.47	6.63
Hypolimnion			124.5		12			1.63	6.47
Culvert At 111 Hamel Rd.			98.1		39			2.00	6.09
Hamel Bk. at 103			267.3		36			5.62	6.74
Hamel Brook			211.2		19			2.54	6.28
Mt. View Shores Beach				2					
Mud Pd. Brook			119.7		16			2.21	6.07
N Hamel Rd. In Lake			59.0		63			4.38	5.69
North Brook			143.3		44			1.51	6.01
North Hamel Rd. Inlet			293.2		58			3.46	6.13
Outlet			124.5		7			1.11	6.74
Route 103 Inlet			31.7		17			0.98	6.22

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.